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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR     | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/775,664      | 02/05/2001  | Paul Kevin Shufflebotham | 015290-508          | 9320             |

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EXAMINER

ZERVIGON, RUDY

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1763

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DATE MAILED: 04/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/775,664

Applicant(s)

SHUFFLEBOTHAM ET AL.

Examiner

Rudy Zervigon

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 50-53 and 55-70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 50-53 and 55-70 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

*Applied*  
*with* 2. Claims 50-53, and 55-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (U.S.Pat. 6,070,551) in view of Shufflebotham et al (USPat. 6,106,678). Li et al teaches an ICP reactor (Fig.3) with a plasma processing chamber (18, Fig.3). An RF biased (22, Fig.3) substrate holder (40/42, Fig. 3) is shown. The plasma processing chamber includes a planar electrically conductive coil (9, Fig.3) disposed outside the process chamber. Gas orifices (64/56a, Fig.3, 5) are shown to orientated the processing gas along an axis of injection that intersects an exposed surface of the substrate at an acute angle. Li also discusses gas ring injectors (column 8, lines 13-15). RF energy sources (32, 16; Fig.1,2) are also described.

Process gases as claimed are used in the fabrication of FSG films (col. 5, lines 12-27). Operating temperatures of the chamber are eluded to: "... (substantially no HF or H<sub>2</sub>O outgassing at temperatures up to 450°C)..." (col. 5, lines 54-56). Li et al specifically teaches an operating pressure within the claimed range of 1mTorr to 30mTorr. Here, the operating pressures of less than atmospheric, i.e. "vacuum" operations (column 4, lines 57-58) where  $P \leq 760\text{Torr} = 760,000\text{mTorr}$  covers the claimed range. Li et al does not teach a boron or phosphorous containing gas that would form a "BSG" (boro-silicate glass) or a "PSG" (phospho-silicate) film.

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However, Li et al does teach "FSG" or Fluoro silicate glass film formation (column 3, lines 30-35). In advance, it is generally accepted that apparatus claims must be distinguished from the prior art in terms of structure rather than function or the products produced so long as the prior art apparatus is capable of such operation and products. See MPEP 2114.

Li does not teach the additional means for maintaining the substrate holder at a desired temperature and an electrode within the substrate holder.

Shufflebotham teaches a similar inductively coupled plasma processing apparatus (Figure 2) with "conduits 31, 32 which feed the reactant gases to a gas distribution ring extending around the underside of the dielectric window 33" (column 4, lines 54-56) as well as plural rings (column 7, lines 50-55). Specifically, Shufflebotham teaches identical means for maintaining the substrate holder at a desired temperature (column 4, lines 38-41), and an electrode within a ceramic substrate support ("buried electrode therein"; column 4, lines 42-45). Shufflebotham does not teach injectors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the Li et al injectors as part of the Shufflebotham apparatus as described.

Motivation for implementing the Li et al injectors ("nozzles") as part of the Shufflebotham apparatus as described is drawn to the benefits of the Li injectors as being directed to "uniform gas distribution" (column 5, lines 64-66; column 3, lines 57-59).

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***Response to Arguments***

3. Applicant's arguments with respect to claims 50-58 have been considered but are moot in view of the new ground of rejection.

4. With regards to Appilcant's citation of MPEP 2173.05(g) as supporting patentable weight for a process limitation on apparatus claims, the same section (not cited by applicant) of MPEP 2173.05(g) (8<sup>th</sup> Ed.) reads:

“

2173.05(g) Functional Limitations

A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart

“

and, MPEP 2114 requires

“

MANNER OF OPERATING THE DEVICE DOES NOT DIFFERENTIATE APPARATUS CLAIM FROM THE PRIOR ART

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

“

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*Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPat. 6,364,957; 6,230,650; 5,851,298; 5,885,358; 5,614,055; 5,522,936; 6,270,862.


6. Applicant's amendment necessitated the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner

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can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

  
GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700